CLAIM LISTING:

1-8. (***Canceled***)

9. (***Previously Presented)*** An apparatus for the measurement of skeletal joint motion in a subject comprising:

a) a passive motion device for continuously moving a joint which comprises a horizontal platform base and a horizontal passive motion platform composed of a horizontal static platform which is rigidly connected to the upper lateral surface of the platform base and a horizontal laterally movable platform which is flexibly connected to the static platform or to the upper surface of the platform base, in which the static platform is adjacent to the laterally movable platform which together both form the passive motion platform, in which the movement of the laterally movable platform is continuously driven during sampling of images by a motor attached to the platform base where movement of the laterally movable platform is achieved by means of a control arm that operably connects the laterally moveable platform to the motor;

b) an imaging device; and

c) a processing system which comprises a computer incorporating a means for real time digital sampling of images of the continuously moving joint during a continuous movement of the joint, means for recording time code and data from the passive motion platform during the continuous movement of the passive motion platform; means for storage of these images at high resolution; means for recognising templates attributed to individual bones and tracking these automatically using cross-correlation functions; and means for geometric transformation of the positional data to graphically display their relative motion over time.

10. (***Previously Presented)*** An apparatus as claimed in claim **9**, in which the imaging device is an X-ray tube and image intensifier with dosage control.

11. (***Previously Presented)*** An apparatus as claimed in claim **9**, in which the imaging device is a magnetic resonance scanner.

12. (***Previously Presented***) An apparatus as claimed in claim **9**, in which the laterally movable platform is situated on a support which lies on the upper surface of the platform base.

13. (***Previously Presented***) An apparatus as claimed in claim **12**, in which the imaging device is an X-ray tube and image intensifier with dosage control.

14. (***Previously Presented***) An apparatus as claimed in claim **12**, in which the imaging device is a magnetic resonance scanner.

15. (***Previously Presented***) A method for an automated measurement of the relative motion of skeletal structures in vivo comprising:

i) positioning a subject on the passive motion device as defined in claim **9;**

ii) initiating an imaging procedure of the subject positioned on the passive motion device and collecting image data using an imaging device;

iii) sampling data collected by the imaging device into the processing system and superimposing time code on the images;

iv) tracking templates marked on individual bone segments at the start of the motion sequence;

v) transforming a result of tracking to reflect a changing spatial relationship between image segments; and

vi) presenting the output in graphical form.

16. (***Previously Presented***) A method according to claim **15**, in which the imaging device is an X-ray tube and image intensifier with dosage control.

17. (***Previously Presented***) A method according to claim **15**, in which the imaging device is a magnetic resonance scanner.

18. (***Previously Presented***) A method according to claim **15**, in which the laterally movable platform is situated on a support which lies on the upper surface of the platform base.

19. (***Previously Presented***) A method according to claim **18**, in which the imaging device is an X-ray tube and image intensifier with dosage control.

20. (***Previously Presented***) A method according to claim **18**, in which the imaging device is a magnetic resonance scanner.

21. (***Previously Presented***) A method according to claim **15**, in which a calibration step is carried out prior to the method steps i) to vi).

22. (***Previously Presented***) A method according to claim **15**, in which the relative motion of lumbar vertebrae L3 to L3, L3 to L4 and L4 to L5 are tracked simultaneously or separately.

23. (***Previously Presented***) A method according to claim **21**, in which the relative motion of lumbar vertebrae L3 to L3, L3 to L4 and L4 to L5 are tracked simultaneously or separately.

24. (***Currently Amended***) A method for a diagnosis of a pseudoarthrosis in a subject, the method comprising analysing the relative motion of skeletal structures in the patient according to the method of claim **15**, and comparing said relative motion to a range of motion of skeletal structures of a normal population of people.

25. (***Previously Presented***) A method according to claim **24**, in which the imaging device is an X-ray tube and image intensifier with dosage control.

26. (***Previously Presented***) A method according to claim **24**, in which the imaging device is a magnetic resonance scanner.

27. (***Previously Presented***) A method according to claim **24**, in which the laterally movable platform is situated on a support which lies on the upper surface of the platform base.

28. (***Previously Presented***) A method according to claim **27**, in which the imaging device is an X-ray tube and image intensifier with dosage control.

29. (***Previously Presented***) A method according to claim **27**, in which the imaging device is a magnetic resonance scanner.

30. (***Previously Presented***) A method according to claim **24**, in which a calibration step is carried out prior to the method steps i) to vi).

31. (***Previously Presented***) A method according to claim **24**, in which the relative motion of lumbar vertebrae L3 to L3, L3 to L4 and L4 to L5 are tracked simultaneously or separately.

32. (***Previously Presented***) A method according to claim **30**, in which the relative motion of lumbar vertebrae L3 to L3, L3 to L4 and L4 to L5 are tracked simultaneously or separately.

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